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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/801,913	03/16/2004	William B. Whitten	6321-244	3077
30448	7590	11/02/2004	EXAMINER	
AKERMAN SENTERFITT			SOUW, BERNARD E	
P.O. BOX 3188			ART UNIT	
WEST PALM BEACH, FL 33402-3188			PAPER NUMBER	

2881

DATE MAILED: 11/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/801,913

Applicant(s)

WHITTEN ET AL.

Examiner

Bernard E Souw

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1 and 6-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cooks et al. (USPAT 6,762,406) in view of Stafford et al. (USPAT 4,540,884) or Hashimoto et al. (USPAT 6,423,965).

► Regarding the independent claims 1 and 13, Cooks et al. disclose an ion trap based system (an individual ion trap shown in Fig.1), comprising an ion trap array including a plurality of ion traps arranged in a 2-dimensional array for initially confining ions, as shown in Figs. 4A-B, 5A-B, 7A-B and 8, recited in Col.5/ll.65-67, Col.6/ll.1-35, Col.7/ll.35-67 and Col.8/ll.1-55, each of the ion traps comprising a central electrode as represented by ref. no. 21 in Figs. 4A-B, by ref. no. 26 in Figs. 5A-B, by ref. no. 31 in Figs. 7A-B, by ref. no. 42, 48 in Fig. 8 and by ref. no. 64 in Fig. 11, each central electrode having an aperture as represented by ref. no. 22 in Figs. 4A-B, by ref. no. 27 in Figs. 5A-B, by ref. no. 33 in Figs. 7A-B, by ref. no. 43, 49 in Fig. 8 and by ref. no. 63 in Fig. 11, and a first and second end cap electrodes, each having an aperture, as represented by ref. nos. 44-46 and 50-51 in Fig. 8, respectively. Further, Cooks' ion trap array is equipped with a structure (not shown) for simultaneously directing a

plurality of different species of ions out from at least one of the ion traps, as recited in Col.9/II.10-16 and Col.9/II.27-33, and a spectrometer (not shown) including a detector 67 shown in Fig.11, for receiving and identifying the ions, as recited in Col.9/II.29-44.

Although Cooks' ion trap system does not explicitly recite a specific type of (mass) spectrometer, each of the ion trap itself is basically a mass (m/z) analyzer, as recited in Col.9/II.9/II.27-44. Furthermore, it is generally also known in the art that an auxiliary mass spectrometer can be added in tandem to a first stage of Cooks' ion trap array 44-42-46 shown in Fig.8, e.g., replacing the second ion trap array 50-48-51.

However, Cooks' ion traps do not have a first and second insulator each having an aperture and sandwiching the central electrode.

Stafford et al. show that a quadrupole ion trap as shown in Fig. 2 may be conventionally equipped with a first and second (ceramic) insulator 38 and 39, respectively, sandwiching the central (ring) electrode 11, as recited Col.5/II.27-32 and Col.5/II.36-38.

In the alternative, Hashimoto et al. also disclose a quadrupole ion trap that may be conventionally equipped with a first and second (quartz) insulator 204 shown in Fig. 14, sandwiching the central (ring) electrode 306, as recited Col.10/II.40-50.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a first and second insulator sandwiching the central electrode to electrically isolate the latter from the end cap electrodes, as taught by Stafford et al. or Hashimoto et al., since such pair of insulators are as effective as a

single insulator spacer conventionally used to separate the central ring electrode from the end cap electrodes, as generally known in the art.

► Regarding claim 8, Cooks' prior art (Kaiser et al.) discloses a miniature mass spectrometers having a dimension of 2.5 mm, thus appropriate for use in an array, as recited in Col.2/ll.1-5. Cooks' embodiment shown in Fig. 6A-C has a radius of 5 to 6 mm and a length of 6.8 mm, which are within the same order of magnitude as those recited in claims 6 and 7.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to slightly reduce Cooks' dimension in case smaller ion traps for use in a smaller array are desired, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

It would have been further an obvious matter of design choice to reduce Cooks' dimension a little bit further in case smaller ion traps for use in a smaller array are desired, since such a modification would have involved a mere change in the size of the component. A change in size is generally recognized as being within skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

► Regarding claim 8, Cooks' plurality of ion traps shown in Figs. 5A-B and Fig. 8 have substantially equal geometries.

► Regarding claim 9, Cooks' plurality of ion traps shown in Figs. 4A-B and Figs. 7A-B have different geometries.

- ▶ Regarding claim 10, Cooks' central electrodes as well as Cooks' first and second end cap electrodes shown in Figs. 4A-B, 5A-B, 8 and 11-13 are each formed from a single plate. An adaptation of Stafford's or Hashimoto's teaching to Cooks' ion trap array would consequently make each of the first and second insulators also from a single insulator plate, such an adaptation being fully within skill in the art.
- ▶ Regarding claim 11, Cooks' ion trap arrays comprise an ionization source 67, 78 and 83 shown in Figs. 11, 12 and 13, respectively.
- ▶ Regarding claim 12, Cooks' ion trap arrays comprise an electron impact (EI) ionization source, as recited in Col.10/II.63-66.

2. Claims 2-5, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cooks et al. in view of Stafford et al. or Hashimoto et al., and further in view of Clemmer et al. (USPAT 5,905,258).

Cooks et al. in view of Stafford et al. or Hashimoto et al. show all the limitations of claims 2-5, 14 and 15, as previously applied to their parent claims 1 and 8-13, except for specific claim limitations that are all rendered obvious by Clemmer et al. and individually addressed as follows:

- ▶ Regarding claims 2, 3, 14 and 15, it is generally known in the art that an auxiliary mass spectrometer can be added in tandem to a first stage of Cooks' ion trap array 44-42-46 shown in Fig.8, e.g., replacing the second ion trap array 50-48-51, as already recited previously. This auxiliary spectrometer may be in the form of either a time-of-flight mass spectrometer (TOFMS) or an ion mobility spectrometer (IMS), or both, as

recited by Clemmer et al. in the Abstract/lines 1-13. As shown in Fig. 4, Clemmer's TOFMS is shown by ref. no. 36 and the IMS is shown by ref. no. 34, as recited in Col.6/ll.24-46.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an auxiliary spectrometer in sequence to Cooks' first ion trap array 44-42-46 shown in Fig.8, i.e., replacing Cooks' second ion trap array 50-48-51 with Clemmer's IMS 34 and/or TOFMS 36, since those mass spectrometer types are simpler to operate than Cooks' quadrupole ion trap, as generally known in the art.

► Regarding claim 4, in case of TOFMS, Cooks' quadrupole ion trap as modified by Stafford et al. or Hashimoto et al. is positioned between the IMS and the ion source, as recited in the Abstract/lines 3-4 from bottom. In this case (Fig. 4) the entire length between Clemmer's ion source 74 (which is substituted by the second end cap of Cooks' modified quadrupole ion trap) and the detector 116 is a drift region (drift tube 40) in Clemmer's Fig. 4).

► Regarding claim 5, in case of TOFMS, Cooks' quadrupole ion trap as modified by Stafford et al. or Hashimoto et al. is positioned between the TOFMS and the ion source, as recited in the Abstract/lines 5-9 from bottom, with the IMS being eliminated if it is undesired or not required. In this case an acceleration grid (89, 94, 102 and 112, shown in Clemmer's Fig.4) is disposed between the second end cap of Cooks' modified quadrupole ion trap at the position of Clemmer's ion source 74 and the detector 116.

3. Claims 2-5, 14 and 15 are alternatively rejected under 35 U.S.C. 103(a) as being unpatentable over Cooks et al. in view of Stafford et al. or Hashimoto et al., and further in view of Bateman et al. (US-PGPUB 2003/0001084).

Cooks et al. in view of Stafford et al. or Hashimoto et al. show all the limitations of claims 2-5, 14 and 15, as previously applied to their parent claims 1 and 8-13, except for specific claim limitations that are all rendered obvious by Bateman et al., as recited in sect. [0090] and [0091] in reference to Fig.6 and sect. [0112] to [0115] in reference to Fig.8, wherein the ion trap is shown by ref. no. 2, the IMS by ref. no. 4 and the TOFMS by ref. no. 11.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an auxiliary spectrometer in sequence to Cooks' first ion trap array 44-42-46 shown in Fig.8, i.e., replacing Cooks' second ion trap array 50-48-51 with Bateman's IMS 6 and/or TOFMS 11, since those auxiliary mass spectrometer types are simpler to operate than Cooks' quadrupole ion trap, as generally known in the art.

Communications

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw whose telephone number is 571 272 2482. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm..

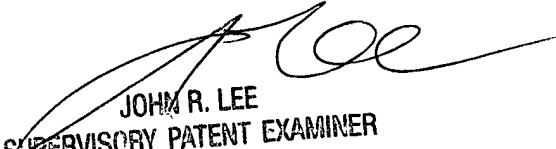
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 571 272 2477. The central fax phone

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number for the organization where this application or proceeding is assigned is (703) 872-9306 for regular communications as well as for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

bes
October 28, 2004


JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800